

CLAIMS

1. Process for the preparation of high density green compacts comprising the following steps:
 - providing an iron or iron-based powder wherein less than about 5 % of the iron-based powder particles have a size below 45 μm ;
 - optionally mixing said powder with graphite and other additives;
 - uniaxially compacting the powder in a die at a compaction pressure of at least about 800 MPa and
 - ejecting the green body from the die.
2. Process according to claim 1 wherein the compaction is performed in a single step.
3. Process according to claim 1 or 2, wherein at least 50 %, preferably at least 60 % and most preferably at least 70 % of the iron-based powder consists of particles having a particle size above about 106 μm .
4. Process according to any one of the claims 1-3, wherein at least 50 %, preferably at least 60 % and most preferably at least 70 % of the iron-based powder consists of particles having a particle size above about 212 μm .
5. Process according to claim 4, wherein the maximum particle size is about 2 mm.
6. Process according to any of claims 2-5, wherein the graphite is present in an amount of 0.1-1.0 %.
7. Process according to any of claims 1-6, wherein the iron-based powder is combined with a lubricant in an amount between 0.05 and 0.6 % by weight before compaction.
8. Process according to any of claims 1-6, wherein the compaction is performed in a lubricated die.

9. Process according to any of claims 7-8, wherein the compaction is performed by using a combination of internal and external lubrication.
10. Process according to any of claims 1-9 wherein the additives are selected from the group consisting of alloying elements such as Mn, Cu, Ni, Cr, Mo, V, Co, W, Nb, Ti, Al, P, S and B machinability enhancing agents, hard phase materials and flow agents.
11. Process according to any of claims 1-10, wherein the compaction is performed at a pressure of at least 900 MPa, more preferably at least 1000 and most preferably above 1100 MPa.
12. Process according to any of claims 1-11, wherein the compaction is performed at ambient temperature.
13. Process according to any of claims 1-11, wherein the compaction is performed at elevated temperature
14. Process according to any of claims 1-13 for preparing sintered products said process further including a single sintering step at a temperature above 1100°C.
15. Powder composition comprising an iron or iron-based powder wherein less than about 5 % of the powder particles have a size below 45 μm ; and 0.1-1.0 % by weight of graphite.
16. Powder composition according to claim 15 further including 0.05 – 0.6 % by weight of a lubricant.
17. Composition according to claim 15 or 16, wherein at least 50 %, preferably at least 60 % and most preferably at least 70 % of the iron-based powder have a particle size above about 106 μm .
18. Composition according to claim 17, wherein at least 50 % of the iron-based powder particles have a particle size above about 212 μm .

19. Composition according to any one of the claims 15-18 further including additives selected from the group consisting of alloying elements such as Mn, Cu, Ni, Cr, Mo, V, Co, W, Nb, Ti, Al, P, S and B machinability enhancing agents, hard phase materials and flow agents